STATE OF NEVADA—DEPARTMENT OF PERSONNEL

CLASS SPECIFICATION

TITLE	GRADE	EEO-4	CODE
STAFF II, ASSOCIATE ENGINEER	**37***	**B**	**6.228**
STAFF I, ASSOCIATE ENGINEER	**35***	**B**	**6.229**

BENCHMARK DESCRIPTIONS

The following benchmark descriptions are representative examples of how positions are classified at each level in several user agencies, but they are not intended to be all-inclusive. Allocation of new or existing positions not described below must be determined by a review of the nature and complexity of work performed; the knowledge, skills and abilities required; independence/supervision received; scope of responsibility/consequence of error; authority to take action/decision-making; and personal contacts necessary to complete work.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION

Materials Division - Design and evaluate pavement structural sections for new and existing roadways; attend preliminary design field surveys to determine the condition of roadway and required rehabilitation strategies or required testing to aid in the design process; evaluate soil, traffic, falling weight deflectometer, and historical data; develop appropriate rehabilitation strategy and/or new structural section using computer programs and engineering judgment; attend specification review meetings to ensure roadways are constructed to standard specifications.

Construction Division - Conduct on-site construction inspections to ensure conformance to applicable specifications and recommend appropriate corrective action when needed. Provide quality control for construction activities; prepare reports; review field data for completeness and content and direct changes to data to conform to established guidelines; analyze data utilizing established formulas designed for specification conformance analysis. Review the plans and special provisions package for errors and omissions; participate in pre-construction conferences, contract plans and special provision review meetings, final inspections of construction projects, and field traffic control reviews of construction projects; write and coordinate agreements for consultant engineering; coordinate projects with workers from local entities. Review and process contractor payments and contract change orders to ensure charges and orders are correct and justified. Prepare final reports and Construction Engineering Manpower Management (CEMMS) reports for construction contracts awarded by the department.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: highway specifications and engineering principles related to highway construction to properly analyze plans and specifications; critical path method of scheduling projects.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: the Federal Highway Administration's Manual on Uniform Traffic Control Devices; design methods and quantity calculation methods used by the department's design division so that plans and specifications can be reviewed properly; current construction practices; operation of various materials testing equipment; the pay estimate system from start of cycle to finish. **General knowledge of:** Rental Rate Blue Book for construction equipment. **Ability to:** operate various types of nuclear testing devices; analyze field construction data using statistical approach methods.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Environmental Services Division

Water Quality - Provide water quality clearance for highway projects; write technical reports for inclusion in environmental documents; prepare summary for the Draft Environmental Impact Statement and the Final Environmental Impact Statement and respond to comments; ensure the department is in compliance with federal and State water quality regulations.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: hydrology; storm water systems. **Ability to:** perform water quality tests; compute water quality data; write technical reports on highway impacts to water quality and floodplains for publication in the Draft Environmental Impact Statement; read technical, legal and scientific documents such as interlocal agreements, best management practices for storm water, and scientific research reports on storm water.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: highway design; water quality and floodplain documentation sources; water quality constituents; federal and State water quality and floodplain laws; federal highways guidance material for preparation of environmental documents; Federal Highway Administration requirements; State and federal National Pollutant Discharge Elimination storm water permit; Nevada Revised Statutes and Nevada Administrative Code on water quality; drinking water systems utilizing ground and/or surface water; State drinking water standards; drinking water source contamination and its effects; correction of contaminated drinking water source; types and environmental effects of roadway runoff pollutants. **Ability to:** establish valid water quality monitoring sites above and below proposed construction site; correlate test results with State water quality standards; propose changes, when necessary, on roadway runoff; successfully convey to others a highway project's impact to water quality; determine the best equipment that meets federal Environmental Protection Agency water quality testing standards.

Hazardous Waste - Perform hazardous material and waste site assessments and field investigations to identify potential risks. When necessary acquire the services of the consultant on contract for site assessments; determine the scope of work to be performed by the consultant and monitor consultant operations to ensure adherence to contract. Develop and update site plans regarding storage and usage of materials; communicate with regulatory agencies to obtain guidance, learn of new or upcoming regulations, or respond to complaints, questions or comments; assist department personnel regarding hazardous waste related problems; maintain hazardous waste recordkeeping system to ensure compliance with federal, State and local hazardous waste requirements; prepare reports, letters, memoranda, work plans and presentations for federal, State and local agencies, department personnel and the public; inspect treatment, storage and disposal facilities used by the department; train department personnel on proper packaging, storage, transporting or disposal of hazardous waste.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: hazardous materials and waste regulations and terminology; Occupational Safety and Health Administration regulations.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: chemistry and incompatible chemicals. **Ability to:** use personal protective equipment including respirators; recognize an emergency situation and take appropriate action; create contracts/agreements for hazardous waste functions; present effective training classes.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Operations Analysis Division - Analyze variables affecting pavement performance and utilize results to maximize performance and minimize costs; conduct pavement rehabilitation studies; develop project priorities for statewide resurfacing, restoration and rehabilitation projects; make recommendations for revenue increases required to bring the condition of the State's highways to an acceptable service level. Perform cost allocation studies to ascertain whether highway users are contributing to the State Highway Fund in proportion to their share of the responsibility for constructing, maintaining, and administering the highway program; and participate in long-term financial planning to project future revenue.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: pavement performance analysis; pavement rehabilitation techniques.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Ability to: work independently laying out projects, performing complex analysis, and reporting the results with minimal supervision; write and modify existing computer programs on the State mainframe computer for sorting, merging, tabulating, graphing, and statistically analyzing pavement condition, construction, maintenance, and other costs.

Specifications - Check project plans and estimates for overall completeness, note errors and omissions and provide recommendations to the project designer, coordinator and/or manager. Inform the specification writer of findings so that needed corrections can be included in the project specific special provisions. Analyze plans and items of work involved to determine construction limitations and make recommendations as to whether requirements need to be addressed in the special provisions. Compile and write special provisions describing project restrictions or requirements, scope of work, materials required, work processes and project milestones, schedule of payments, and supplemental special provisions for advertised bids.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: current construction practices related to the individual project and items of work as well as working knowledge of current Federal Highway Administration policies affecting the special provisions when federal funds are involved. **Ability to:** determine when an expert dealing in specialized work should be consulted to ensure all requirements would be properly addressed in the special provisions.

CADD Management - Participate in the development and implementation of policies and procedures related to the Roadway Design Division's CADD standards; develop and maintain a variety of CADD standards and resource files; configure CADD workstations and servers to aid in the standardization of electronically produced construction plans; develop training programs and training materials on engineering software such as Inroads, MicroStation and other custom developed CADD applications; evaluate and recommend training and materials; plan, lead, conduct and facilitate CADD User Group meetings; train engineering staff in the use of engineering software and monitor progress. Provide CADD support by recommending solutions to engineering staff in order to resolve software problems and challenges related to roadway and hydraulic design and computer-aided drafting; participate in developing, implementing and maintaining customized software and integrating it with the CADD operation; evaluate and implement new technologies as they become available.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: departmental policy memoranda and standards related to engineering; MicroStation and InRoads software functions, features and terminology related to highway design; InRoads preferences; Feature and Symbology Managers; CADD drawing and resource file types. **Skill in:** the use of MicroStation and InRoads to design highways and depict construction details.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

CADD Management: (cont'd)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job): **Working knowledge of:** customization of MicroStation Workspaces; installation and licensing routines for all engineering software used by the division; division workflow relating to the development of construction plans. **Skill in:** evaluating engineering software and third party applications; documenting findings and making recommendations; writing clear and concise engineering software training documentation; reading and understanding technical documentation regarding the installation, configuration and usage of various types of engineering software; making independent decisions and resolving civil design software problems; distinguishing between an engineering software problem and a user problem. **Ability to:** create a simple, intuitive CADD system for both casual and advanced CADD users; provide integrated CADD standards maximizing ease of compliance; create a flexible user interface to accommodate multiple engineering disciplines; maintain strict segregation between core software and customization; reduce the demands on internal CADD support and administration; automate processes and systems to meet management objectives; instruct professional and technical engineering staff in the correct and/or efficient use of engineering software; install all engineering software used by the division; learn and apply new, complex procedures and engineering programs related to highway design.

Traffic Design - Design traffic signal systems and highway lighting systems, traffic sign plans, contract plans showing new traffic sign locations, non-standard signs, overhead traffic sign support structures, traffic striping detail, and special traffic sign details.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application): **Working knowledge of:** federal and State guidelines pertaining to signs, pavement markings and traffic control. **Ability to:** prepare interlocal agreements with county and city officials for the purpose of constructing and maintaining signal and lighting systems.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job): **Working knowledge of:** federal, State and department rules, regulations, laws, policies and procedures regarding the design, construction, operation and maintenance of traffic signal and lighting systems; traffic control plan development; State standards for road and bridge construction. **Ability to:** read and interpret electrical schematics and create and draft electrical line diagrams; prepare plans, specifications, and estimates for the physical construction of highway lighting systems and traffic signal systems including roadway design items of work; write concise, logical, grammatically correct reports to explain change orders to contracts and supplemental notices to bidders; write technical reports on experimental pavement marking and signing projects.

Structural Division (Bridge) - Identify new, replaced and/or rehabilitated bridges and map the location of each bridge for future scheduling purposes; identify and communicate with owners to obtain bridge plans and specifications; review bridge plans, perform simple structural analysis to determine inventory and operating load ratings, compile data and update existing bridge inventory files required by the Federal Highway Administration for inclusion in the National Bridge Inventory; act as team leader in conducting on-site inspections of in-service bridges to gather field data required; prepare final inspection reports for transmittal to various structure owners, convey information pertaining to any deficiencies the structure may exhibit, and provide updated data to local and regional federal offices and other interested agencies.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITES (required at time of application): **Working knowledge of:** structural design and analysis procedures; bridge inventory and inspection procedures; computerized databases and analytical procedures. **Ability to:** identify defects in components of structures; inspect structural components and document their condition.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Structural Division (Bridge) (cont'd)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILTIES (typically acquired on the job): **Working knowledge of:** National Bridge Inventory requirements and National Bridge Inspection Standards related to bridge inventory and inspection procedures; the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges; State bridge inventory computer systems. **Skill in:** complex computer analyses involving bridge inspection and inventory data. **Ability to:** extract data from plans and field measurements; perform detailed inspections of in-service bridges in accordance with National Bridge Inspection standards; thoroughly document all inventory and inspection information.

Districts - Inspect and review State maintained street and highway signs and markings to determine if traffic safety or capacity could be improved; recommend changes; and review modified areas to determine effectiveness. Review major projects, subdivisions and parcel maps and provide recommendations and requirements to the appropriate county or city planning agencies concerning the project's impact on department facilities. Review traffic control plans submitted for permitted encroachment work on the highway system to ensure compliance with established standards and guidelines; approve traffic control plans or prepare traffic control plans when approval by local entity is required or requested.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application): **Working knowledge of:** principles set forth in federal and State guidelines for proper use of traffic control devices such as signs, striping and lighting. **Ability to:** draw sketches of traffic control plans and changes to existing highway signage and marking to enable crews to place signs, barricades and markings.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job): **Ability to:** visualize effect on traffic flow caused by modifying highway signs or markings that provide guidance to drivers; make recommendations for modification of signs or markings that are clear, concise and comply with established policy and guidelines; inspect traffic control devices to determine compliance with federal and State guidelines; coordinate traffic control device changes to allow time to manufacture the signs and schedule crews.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF CONSERVATION & NATURAL RESOURCES

Division of Environmental Protection - Review permit applications, engineering reports, proposals and plans for activities and operations subject to State and federal regulations governing wastewater treatment, air pollution control, solid and hazardous waste management, and site remediation; determine if facilities utilize sound engineering practices; develop permit conditions, prepare draft permits that conform to State and federal air, water, and waste regulations and defend recommendations in public hearings. Oversee and perform field investigations and inspections of wastewater treatment facilities, industrial operations with air pollution control devices, solid and hazardous waste management facilities and remediation sites; collect samples, analyze data and prepare reports for agency and public review; collect and perform quality assurance and control functions on data for reports and studies designed to monitor air and water quality; review corrective action plans for compliance with established remediation standards; recommend enforcement action for permit and law violations.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application): **Working knowledge of:** engineering principles and practices related to water and air pollution control and waste management; principles of chemistry, hydraulics, hydrology, geology, bacteriology and meteorology related to environmental protection. **Ability to:** evaluate suitability of generally recognized environmental technologies for specific applications; provide and support recommendations

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF CONSERVATION & NATURAL RESOURCES (cont'd)

Division of Environmental Protection (cont'd)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (cont'd)
based on technical reports and other sources of information pertaining to environmental field; prepare clear, concise reports and correspondence.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: federal and State laws, regulations, guidance documents, technical reports and other sources of information pertaining to environmental fields. **Ability to:** critique and provide comment upon review of technical documents related to environmental technologies, regulations and management practices; prepare factual and legally defensible permit documents.

Division of Water Resources - Perform technical and statutory review of water right applications for publication; answer inquiries regarding Nevada Water Law and division policies and procedures from government agencies, private citizens, real estate companies, consultants, and utility companies; provide information regarding the procedures and fees required for filing applications to appropriate water, applications to change water right permits, proofs of completions, proofs of beneficial use, and extensions of time with the State Engineer. Perform field investigations; inspect well drilling and abandonment to ensure well operations conform to Nevada Water Law; perform proof of beneficial use inspections to determine if use of water conforms to State law and terms of permit, and meets the requirements for issuance of a certificate; draft certificates for review by the certificate committee; and inspect applications and permits to determine if water usage and well operations comply with Nevada Water Law and the terms of the permit. Conduct ground water pumpage field inventories to monitor ground water depletions and prepare comprehensive reports of the inventories. Assist the Hearing Officer by preparing and presenting written rulings that include findings of fact and conclusions of law. Perform initial review of tentative and final subdivision maps, recommend approval or denial to the Deputy State Engineer based on water rights information and geohydrologic data.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: well drilling practices sufficient to ensure regulatory compliance; hydrology and hydrographic features sufficient to recognize what terrain features indicate about ground water movement and interpret the lithology of well driller's reports; the Nevada Water Law. **Ability to:** operate and understand calculators, computers, water measuring equipment and surveying instruments; read and make maps accurately; make accurate and quick estimates of water volumes, diversion rates and conversions to provide approximate answers to questions; recognize specific hydraulic engineering hardware in the field; recognize man-made features which indicate the presence of a well or well driller.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: the division's book records and publications; rulings and orders of the State Engineer, policies of the division, regulations for the drilling of water wells and related drilling, certain court actions', intrastate water agreements and federal decrees; procedures in protest hearings. **Ability to:** write concise, logical, grammatically and factually correct draft rulings of the State Engineer or analytical reports to advise the State Engineer on water related issues.

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF HUMAN RESOURCES

Health Division - In the Bureau of Health Protection Services, review and recommend approval of engineering plans and specifications for the construction of public drinking water systems, public swimming pools and spas, subdivisions, camps, recreational vehicle parks and individual wastewater disposal systems in order to code the standards that apply to the design. Perform inspections and invest-

STAFF II, ASSOCIATE ENGINEER - DEPARTMENT OF HUMAN RESOURCES

Health Division (cont'd)
igations of the construction and operation of facilities and systems regulated by the State Board of Health to determine the facts, causal factors, responsibility for the problem and the severity of degradation of the problem; prescribe corrective action and, upon satisfactory correction, remove restrictions. Provide technical consultation to the private and public sector to ensure the promotion of acceptable standards of public health, sanitation, cleanliness and safety in the State.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Detailed knowledge of: investigation, evaluation, design, construction and operation of drinking water systems, structures, equipment or projects in order to safeguard the public health. **Working knowledge of:** technical reports on fluid dynamics in open channels, full and partially full conduits and sheet flow. **Ability to:** determine compliance on new or previously constructed infrastructures being inspected and direct corrective actions; assist/consult with private and public sector on public health objectives and technical matters.

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION

Environmental Services Division - Air Quality - Prepare environmental clearance reports for department projects; determine compliance and conformity with the Clean Air Act of 1990 and the National Ambient Air Quality standards; develop and prepare material site applications; collect and compile airborne particulate data from high volume samples; submit data to management for review. Perform field studies by determining the number of sites to be sampled, the specific location of each site, the type of sample taken, whether or not meteorological data should be obtained, and the appropriate collection method.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Ability to: lift heavy objects and walk on all kinds of terrain with a pack.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: air monitoring equipment uses, needs, operations and functions; federal regulations on ambient air quality surveillance; meteorology, emissions, chemistry, and physics and their inter-relationships; safety precautions necessary in handling carbon monoxide gas and high pressure gas cylinders; operation and calibration methods used in air quality testing instruments and equipment; construction practices; concrete and asphalt batch plants; engineering principles pertinent to the air quality program and their relationship to the environment. **Ability to:** research specifications, schematics, drawings and manuals, and apply information to the specific needs of a project; research outside information and evaluate possible uses.

Environmental Services Division - Noise Control - Develop noise level models and evaluate noise reduction value, economic factors and height requirements of sound walls to determine cost effectiveness. Conduct existing noise readings to determine impacted and sensitive areas of the project for site locations; schedule a series of timed site readings; take ambient readings at field site for comparison to predicted noise levels. Participate in preparing noise reports by preparing graphics from scaled photos; adapt new alignments and barriers and compile data received from ambient readings, noise models, and other divisions into summaries and tables.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Ability to: create graphic displays from existing aerial photos and plans to depict proposed roadways, barriers, and sound walls for public use.

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Environmental Services Division - Noise Control (cont'd)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: proper operation and calibration methods of equipment and instruments used in noise level studies. **Ability to:** use electronic instrumentation such as noise analyzer, wind meter, speed meter, calibrator and related equipment.

Materials and Testing Division - Field Exploration - Perform geological studies to determine potential material site locations; assess pre-established sites to determine the physical character of the geologic materials, measure the dimensions and quantity of material and identify potential environmental, cultural, legal and access constraints; analyze field collected data to determine the suitability of geologic materials for construction; write summary and preliminary reports and other documents related to construction material occurrence, character and method of location. Prepare for acquisition of material by researching property ownership; calculate rough quantities needed to ensure aggregate source area is adequate; verify the location of the site by conducting on-site search for known points and marks; meet with owners and conduct survey of property to determine if there are limitations or factors that affect site use; obtain clearances for acquisitions.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
General knowledge of: surveying techniques and practices sufficient to locate property corners determine elevations and distances from established reference points, and calculate areas and volumes.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: laboratory materials testing procedures; federal and State regulations which may restrict or permit land use activities with respect to exploration of materials or material pit or quarry development. **Ability to:** use and maintain material site inventory records; obtain information describing the legal ownership of land; establish and maintain cooperative working relationships with individuals representing land owner/agencies where materials may be located in order to obtain permission to conduct exploration.

Roadbed Design - Provide material deposit service to determine if material deposit is a viable source for future projects; formulate comprehensive mining plans to include excavation methods, processing plants, dust control, bonding requirements and reclamation methods; provide material deposit data for contractors, county personnel and the public; prepare material specifications to determine what materials will be required for a project; participate in field reviews of construction methods and practices on current projects.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: related outside agencies, such as Bureau of Land Management, county agencies and Federal Highway Administration.

Lab Services - Direct the statewide quality assurance program for the division; monitor the current status of certification and supporting documentation submitted by the contractor for each project; document and process reports to ensure proper sampling quantities on a contract and record failing materials; research specification requirement and reference standard plans and specifications to provide engineers and contractors with a formulary for use of material requirements to be met in order to accept a contract; prepare letters of acceptance; and notify the Federal Highway Administration that all materials were accepted and the job was completed within federal guidelines. Ensure that lab personnel are certified to meet the American Association of State Highway and Transportation Officials specifications by keeping active records on personnel with respect to origination dates, lab functions, longevity within the lab and test methods they are qualified to employ.

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Lab Services (cont'd)

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: highway materials specifications and testing procedures; testing terminology.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: research in materials and highway construction methods. **Ability to:** determine the emphasis to be placed upon each separate material or item incorporated into each construction project.

Geotech Lab - Perform advanced consolidation permeability, direct shear, and triaxial studies on data obtained and collected by technical staff to determine characteristics of tested soils and analyze obtained test data to determine physical properties of soils; establish parameters to be used in conducting advanced soil mechanics tests; develop testing procedures in accordance with proper guidelines and specifications. Select appropriate variable to be used in testing programs and evaluate validity of data generated; evaluate the data using engineering calculations to monitor the progress of tests. Based on the analysis, determine if the data will provide the design engineers with the information they need; evaluate test progress and implement necessary changes in order to provide pertinent design data. After completion of tests, perform final engineering calculations based on all data collected; conduct a final analysis based on the calculations and review results with geotechnical engineers.

Road Design Division - Roadway Design - Participate in design work of a moderately complex nature involving the calculation of horizontal and vertical curves and related design elements; calculate contract plan quantities for earthwork base and surface, striping, guardrail, traffic control and other items; utilize the CADD system to design and prepare scaled drawings of title and location sketches, typical sections, base and surface summaries, plan and profile sheets, special details, striping details, traffic control plans, and structure lists; conduct research regarding project history, as-built plans, construction plans, survey and previous fieldwork; gather information on existing features such as measurements of slopes, guardrail, drainage features, sidewalk, curb and gutter, and utilities; utilize computer systems in the preparation and maintenance of engineer's estimates, and preliminary and final agreement estimates; update estimates as necessary and perform economic analysis to determine the best benefit/cost ratio of alternate designs.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: practical application of computer software including CADD software; design manuals and standard plans. **General knowledge of:** references, guidelines and procedures related to engineering work; construction and survey practices, roadway design features and elements. **Ability to:** modify and/or adapt standard designs, procedures or methods to fit special project requirements. **Skill in:** deriving quantities using dimensional analysis.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Detailed knowledge of: computer software including CADD software utilized in the preparation of transportation related project plans. **Working knowledge of:** traffic control procedures and design; striping and traffic control devices; application of transportation related geometric design policies, procedures and principles to the design of transportation related projects. **General knowledge of:** divisional policies and procedures. **Ability to:** compare design work to standards and judge whether it is similar to or different from prescribed standards. **Skill in:** cost estimating, planning and preparation of a project utilizing the CADD system to design and prepare scaled drawings for transportation related design projects.

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Standards & Manuals - Provide on-going development of the department's design manual; perform annual review of standard plans incorporating recommended new or revised standards from divisions, districts, the Federal Highway Administration, and members of the multi-disciplinary review committee; work on special and experimental projects; maintain the department's reasonable bid price database.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Ability to: determine cost effectiveness of products or services proposed for use by the department; determine resources within the department for use as support; utilize engineering drafting techniques to convey information to support units.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Ability to: compare plans or proposals for new and existing standards as presented by in-house staff or from outside the department; monitor and oversee construction and/or maintenance of special projects; work independently utilizing resources as required by the task; convey to department personnel design requirements and oversee the construction of experimental or demonstration projects to meet test criteria.

Structural Division (Bridge) - Apply non-destructive testing techniques and procedures to the inspection of fracture-critical and fatigue-prone details in existing steel and concrete structures to ensure the safety of in-service bridges; perform ultrasonic, magnetic particle and dye penetrant inspections and radiographic interpretations of welds in accordance with national codes; communicate with co-workers, management and structural element fabricators to develop and maintain effective quality control/quality assurance procedures, convey structure inspection information and resolve problems; apply National Bridge Inspection Standards to the inspection of in-service bridges to ensure safety of the structures; document in-service bridge conditions and maintenance needs and convey information to structure owners.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
General knowledge of: non-destructive inspection and analysis procedures; bridge inventory and inspection procedures; computerized databases and analytical procedures. **Skill in:** computers and electronic media. **Ability to:** identify defects in the fabrication and condition of components of structures, perform fabrication and in-service inspection of structural components, and document their condition; perform non-destructive testing and inspections of steel and concrete bridges, enforce fabrication procedures and contract specifications and meet with contractor representative to resolve problems.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: National Bridge Inspection Standards pertaining to bridge inspection procedures, PONTIS and Nevada bridge inventory computer systems; American Welding Societies "Bridge Welding Code" D1.5. **Skill in**: performing complex non-destructive testing analyses of in-service bridge and fabrication inspections. **Ability to:** apply the "Bridge Welding Code" to the fabrication inspection of structural elements; perform detailed inspections of in-service bridges in accordance with PONTIS, Nevada and National Bridge Inspection Standards; thoroughly document all fabrication and inspection information.

Districts - Review major projects, subdivisions and parcel maps and provide recommendations and requirements to the appropriate county or city planning agencies concerning the project's impact on department facilities. Manage outdoor advertising control program and potable water testing programs for a sub-district. Review traffic control plans submitted for permitted encroachment work on the highway system to ensure compliance with established standards and guidelines; approve acceptable traffic control plans; and prepare traffic control plans for State maintenance work when approval by local entity is required or requested. Review and process encroachment permits and special event permits; inspect work performed under encroachment permit and perform field reviews of work in progress under

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Districts (cont'd)
construction contracts. Perform material pit reviews and inspections Manage a sub-district's permit program and archive "as-built" records.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Working knowledge of: construction materials, methods and techniques; principles set forth in federal and State guidelines for proper use of traffic control guidelines for proper use of traffic control devices such as signs (temporary and permanent) striping and lighting. **Ability to:** operate basic survey and distance measuring equipment.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: permitting policies and procedures, traffic engineering to perform the duties and tasks assigned; highway construction practices.

Safety/Traffic Division - Highway Safety Improvement Program - Under direct supervision, conduct safety project and special study evaluations; write evaluation reports; develop hazard indicator values for high hazard locations and provide research analysis on identified locations; conduct special studies on potential safety problem locations; identify/select appropriate crash reduction factors.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application)
Working knowledge of: Nevada's network of federal and State highways and local roads. **Ability to:** interpret roadway contract plans.

Railroad Safety Engineering Programs - Establish a Hazardous Railroad/Highway Crossing Priority Index by compiling data to include a field review inventory, accident history, average daily traffic, average daily train traffic, human factors and surface rating review; enter data into computer system and prepare data for diagnostic review to establish which crossings need safety improvements. Establish steps to be taken in railroad safety projects; monitor projects and participate in the final inspection process. Participate in the design of railroad crossing improvements and review of consultant design. Update the Federal Railroad Administration on changes in the status of crossings in Nevada by conducting comparative studies, transmitting updated information to the Federal Railroad Administration and railroad companies.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application)
Knowledge of: at-grade railroad crossing surface rehabilitation, track structure, automatic gate/cantilever circuitry and federal standards for crossing protection. **Ability to:** calculate project material quantities, labor rates and project costs; interpret roadway contract plans.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
Working knowledge of: various statistical test methods used for preparing project evaluation and special study reports; traffic control procedures and design; striping and traffic control devices; application of transportation related geometric design policies, procedures and principles to the design of transportation related projects. **General knowledge of:** the cause and effect relationship between vehicle momentum and accident occurrence; drivers' behavioral characteristics when associated with changes in roadway environment; highway capacity terms and technology; Federal Railroad Administration policies. **Ability to:** compute accident rates, expose factors, vehicle miles of travel, accident reduction factors, and hazard index values to conduct ongoing highway safety programs; calibrate and program digital and computerized distance measuring instruments; formulate a priority hazardous index; write documents to establish standards.

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF TRANSPORTATION (cont'd)

Rotational Engineering Program - The Rotational Engineering Program is a training and development program designed to familiarize incumbents with all aspects of the Nevada Department of Transportation activities. Incumbents rotate through various divisions within the department and work on projects as assigned within the division. Upon satisfactory completion of the program, incumbents are offered an open position in one of the department's engineering divisions.

STAFF I, ASSOCIATE ENGINEER - DEPARTMENT OF CONSERVATION & NATURAL RESOURCES

Division of Environmental Protection - Review and provide input on compliance with engineering principles and regulatory standards of routine permit applications, engineering reports, proposals and plans for activities and operations subject to State and federal regulations governing wastewater treatment, air pollution control, solid and hazardous waste management, and site remediation. Perform routine field investigations and inspections of permitted wastewater treatment facilities, subdivisions and industrial operations with air pollution control devices and facilities for solid and hazardous waste management; collect samples, evaluate data for compliance with agency regulations and prepare reports for review by supervisor or senior engineering staff; collect and enter data for reports and studies designed to monitor air and water quality.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
Knowledge of: basic engineering principles and practices related to water pollution control, air pollution control and waste management; basic principles of chemistry, hydraulics, hydrology, geology, bacteriology and meteorology as applied to environmental protection. **Ability to:** interpret, analyze and summarize federal and State laws, regulations, technical reports and other sources of information pertaining to environmental fields (air, water, waste); prepare clear, concise reports and correspondence.

Division of Water Resources - Analyze routine applications to appropriate or change existing water rights and prepare a recommendation including conditions to be placed on approval; prepare detailed maps, illustrating points of diversion, place of use of the application, nearby water rights, and surface water features; complete a fundamental hydrologic analysis to determine the effect on the groundwater level in the immediate area. Process applications for extension of time, proof of completion of work and protests to the granting of an application; ensure the completeness and accuracy of the submitted information, returning documents if incomplete or deficient, reviewing well logs and other sources of information for comparative purposes. Review proofs of beneficial use and perform field inspections to check the accuracy of submitted information to include surveyed locations and hydrologic information. Provide assistance to the public in water right matters to include explaining local hydrological and engineering conditions and pertinent federal, State and local laws and regulations and specific policies and procedures of water resources.

ENTRY LEVEL KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):
General knowledge of: hydrology and hydrographic features sufficient to recognize what terrain features indicate about groundwater movement. **Knowledge of:** techniques for measuring water in open channels and wells. **Ability to:** perform basic hydraulic calculations; read a map sufficient for precise navigation in an off-road scenario.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):
General knowledge of: the division's book records and publications; well drilling practices sufficient to monitor well driller's regulatory compliance. **Knowledge of:** Nevada Water Law. **Ability to:** sketch a workable map from a known landmark to a found point previously noted on any map; recognize man-made features which indicate the presence of a well or well driller.

	6.229	6.228
ESTABLISHED:	7/1/93P	7/1/93P
	8/31/92PC	8/31/92PC
REVISED:	11/17/93UC	11/17/93UC
REVISED:	9/18/95UC	9/18/95UC
REVISED:	7/1/01LG	7/1/01LG
REVISED	6/25/04PC	6/25/04PC